STAR 2006: NOAA Ship *McArthur II*
Weekly Science Report

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Science Summary: 03 - 09 August 2006

It's week two and I am happy to report that we have made phenomenal progress in casting off those gremlins. Mammal and bird observations are in full swing, acoustics are up and running, and oceanography has hit their stride. The timing was perfect because we have been heading south, reaching 6º N and 117° W by the end of the week, and have seen an increase in the number of sightings and the diversity of species.

We spent much of week on the outside edge of the core eastern tropical Pacific (ETP) study area and observed the phenomenon that rarely occurs in other areas of the world: large schools of spotted and spinner dolphins associated with seabirds and tuna. Several evenings this week, we encountered large feeding aggregations of spotted and spinner dolphins. It is quite an experience to stare out at tall, billowing clouds tinted with the last rays of the sun while we travel among clusters of dolphins scattered to the horizon.

Estimating the number of dolphins in these scattered aggregations can be quite a challenge. I am continually impressed by the dedication of our observers to conscientiously stay focused on a group until they are confident in their estimates. As we move through these aggregations, we sincerely appreciate the excellent maneuvering by the teams on the bridge.

Our total species list has grown this week: striped, eastern and whitebelly spinners, spotted, and bottlenose dolphins, false killer whales, pilot whales, killer whales, and sperm whales. We were able to obtain photographs of killer whale saddle patches from the small boat, which will help to increase our understanding of these offshore populations.

Keep reading for more details about our adventures this week!

Sightings and Effort Summary for Marine Mammals

Date	Start/ Stop Time	Position	Total nm	Average Beaufort
80306	0700	N21:38.90 W123:06.53	123.3	4.0
	1936	N19:55.36 W121:54.86		
80406	0645	N18:57.98 W121:17.61	99.4	4.5
	1920	N17:24.56 W120:18.94		
80506	0652	N16:27.21 W120:23.65	102.1	4.5
	1935	N14:46.30 W121:37.73		
80606	0656	N13:45.58 W122:21.60	83.3	3.8
	1920	N12:14.96 W123:25.46		
80706	0702	N11:10.83 W123:44.61	75.0	3.6
	1830	N10:09.91 W122:31.59		
80806	0703	N09:19.57 W121:31.53	56.4	2.5
	1907	N08:33.54 W120:35.83		
80906	0656	N07:36.94 W119:29.26	114.2	5.0
	1857	N06:20.62 W117:58.65		

Code	Species	Number of Sightings
002	*Stenella attenuata* (offshore)	8
010	*Stenella longirostris orientalis*	4
011	*Stenella longirostris* (whitebelly)	2
013	*Stenella coeruleoalba*	5
018	*Tursiops truncatus*	4
033	*Pseudorca crassidens*	2
036	*Globicephala macrorhynchus*	1
037	*Orcinus orca*	1
046	*Physeter macrocephalus*	1
079	unid. large whale	3
099	*Balaenoptera borealis/edeni*	1
Total		32

Flying Bridge Report (Richard Rowlett)

About 600 miles west of Clarion Island on 06 August, we started our day in calm seas with an unusually accommodating group of killer whales (*Orcinus orca*) that we were able to track for a prolonged period. This was unusual in our experience in these tropical waters because most encounters involve animals that just simply disappear after a few initial sightings. Shortly after that and in the same area, a much less accommodating group of false killer whales (*Pseudorca crassidens*) was sighted. It took some time to relocate these animals after the initial sighting and even more to establish a positive

identification. Throughout the search, we became aware that those dozen or so Tahiti Petrels seemed focused on following something in particular, which led to thoughts of false killer whales. We just kept watching and following the Tahiti Petrels to see what popped up, until lo and behold, *Pseudorca*! There were several in the area and scattered over a few miles. For most surfacings, there was one or several Tahiti Petrels right there in close attendance. This just goes to prove that seabirds often provide subtle cues leading to sightings and even suspected identifications. Tahiti Petrels are largely scavengers in search of any casualty from the depths left floating at the surface, which could easily include scraps left behind by blackfish. Interestingly, this same Tahiti Petrel/false killer whale association was repeated again with another sighting two days later, 735 miles west of Clipperton Island.

Biopsies (Susanne Yin and Erin LaBrecque)

Species	Common Name	Weekly		Total	
		Samples	Takes	Samples	Takes
Delphinus delphis	Short-beaked common	0	0	2	3
Tursiops truncatus	Bottlenose dolphin	3	6	6	9
Total		3	6	8	12

Photo Project (Isabel Beasley and Jim Cotton)

Once again, photo-identification has been rather slow this week. Spinner and spotted dolphins have been pretty much impossible to get close to, let alone photograph – proving even more difficult than streakers (striped dolphins). The highlight for this week was a very exciting encounter of a group of 'slippery' killer whales. Although many individuals were photographed, this group was challenging for identification since the dorsal fins of the females and immature individuals had few distinctive features and their saddle patches (the lighter colored area behind the dorsal fin) were very indistinct. Thanks to the excellent driving of our coxswain Kevin Lackey, good photographs were taken of two adult males, which could be easily identified by their distinctive dorsal fins.

Species	Common Name	Weekly	
		Sightings	Photos
Tursiops truncatus	Bottlenose dolphin	2	4
Globicephala	Pilot whale	1	6
Orcinus orca	Killer whale	1	146
Total		4	156

Seabird and Marine Debris Report (Michael Force and Sophie Webb)

This week began where the previous week left off – low diversity and abundance. The tropical pelagic scavenger, Tahiti Petrel, was the commonest bird early on in this depauperate area – in company with plastic coffee jars, vegetable oil bottles, plastic and styrofoam fishing floats, large styrofoam blocks, and a multitude of bric-a-brac. Perhaps this is the anthropogenic signal of the North Equatorial Current, sweeping all this marine

debris westward into what must be the world's largest garbage bin: the Pacific Ocean (recording marine debris is one of the other hats we wear). Continuing south, sightings of trash decreased, even recording two trash-free days, while seabird abundance increased remarkably. On the final day of the week, we dipped into the far western edge of the ETP core area and were kept busy recording a nearly constant stream of Juan Fernandez Petrels and dark morph Wedge-tailed Shearwaters, two species characteristic of the ETP avifauna. Here in the North Equatorial Countercurrent were numerous seabird feeding flocks, composed almost entirely of Juans and Wedgies. There were many cruise firsts among the 23 species we saw this week: Black-winged and White-winged Petrels, Bulwer's Petrel, Arctic and Sooty Terns, Christmas Shearwater, Great Frigatebird, Harcourt's and Galapagos Storm-Petrels, Pomarine Jaeger, and Red-tailed and Red-billed Tropicbird, the latter species about 370 nm west of Isla Clarion, farther west than expected. Having not seen any Pink-footed Shearwaters since the first day out of San Diego, where they are common along the continental shelf, we were surprised to find eight this far west.

Oceanographic Operations (Melinda Kelley)

I am excited to report that all oceanographic operations are running smoothly. Each day we conduct two CTD casts, one before sunrise and one after sunset, and three XBT drops, at three-hour intervals during daylight hours. Yesterday, as we headed south through the North Equatorial Countercurrent, both the CTD and XBT profiles displayed mixed layers to depths of 77 m. Previously, we had encountered mixed layers to depths between 30 and 35 m. The sea surface temperature has remained a warm 27- 28º C. Both manta and bongo tow operations have worked out their kinks, and tows are now in full swing. The tows have been delivering some exciting and slimy creatures – we will have plenty of jelly samples for the turtle group.

Date	CTD	XBT	Bongo tow	Manta tow
Thursday	2	3	1	0
Friday	2	3	1	1
Saturday	2	3	1	1
Sunday	2	3	1	1
Monday	2	3	1	1
Tuesday	2	2	1	1
Wednesday	2	3	1	1
Total	14	20	7	6

Squeakly Report (Shannon Rankin and Liz Zele)

The week started with another temper tantrum from our hypochondriac array. The symptoms changed with various tests, until miraculously the array seemed to have 'fixed' itself. The next day it was in the water and feeling fine; maybe sometimes even inanimate objects need a day off . . . Unfortunately, Liz and I pay the price by working all day until we figure out the bug. Now that the array is happy again, we have managed to hear

fantastic vocals from all of the usual suspects, and at least one unusual suspect. We had one brief encounter with some echolocation clicks that did not appear to be from dolphins (beaked whales?). The acoustics team had a dozen dolphin encounters not detected by the visual team as well as three sperm whale encounters (many detections were outside the observers range).

Dipnetter's Delight (Jim Cotton)

The distribution of flyingfish between the Tropic of Cancer and the North Equatorial Countercurrent along our track line has been extremely patchy. During daytime observations, we commonly see five or more species of fliers, but our luck at stopping on the patch for the evening dipping stations has not been good. Last night was our first station in the North Equatorial Countercurrent and the presence of four species of flyingfish and the first sighting/specimen caught of Oxyporhamphus (the short-winged flyingfish) reflected productivity in this area. The highlight of the week was watching a five-foot hammerhead shark bump the side of the ship.